REPORT

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1-1

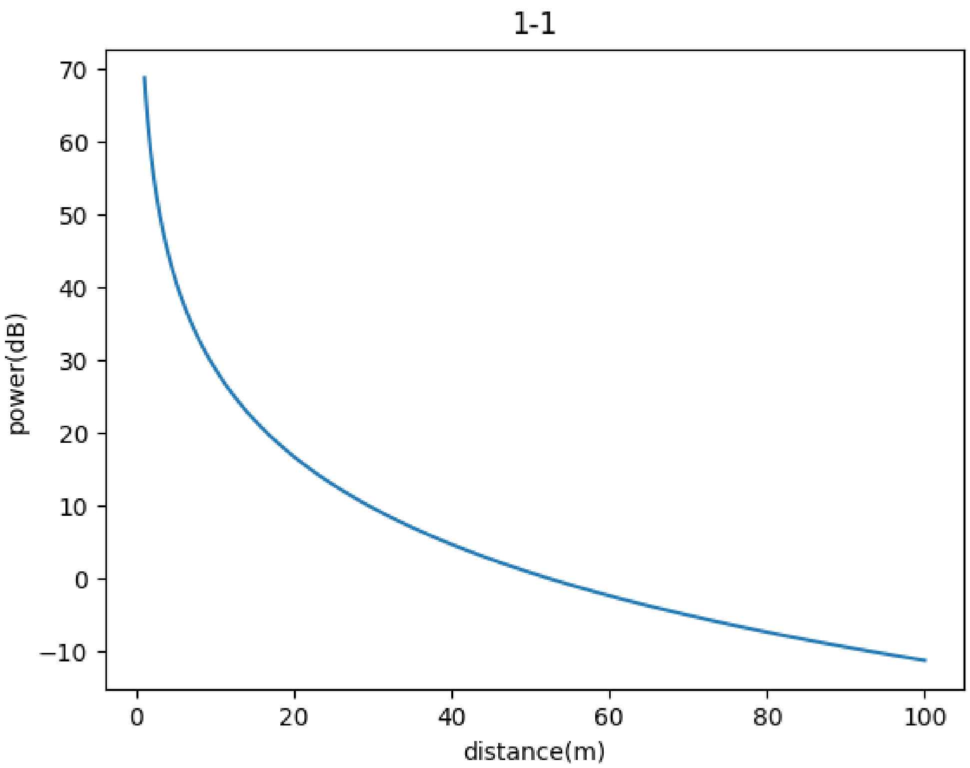
Radio propagation model: $P_R = \alpha^2 10^{\frac{x}{10}} g(d) P_T G_T G_R$

From the formula, we can find that power is a function of distance between base station and mobile device. Because Alpha and x are overlooked here, we only need to acquire $g(d) P_T G_T G_R$.

From $g(d) = \frac{(h_t h_r)^2}{d^4}$, the received power signal are computed.

Convert Watt to dB: $dB = 10 \log W$

Figure1-1 shows the simulation result.



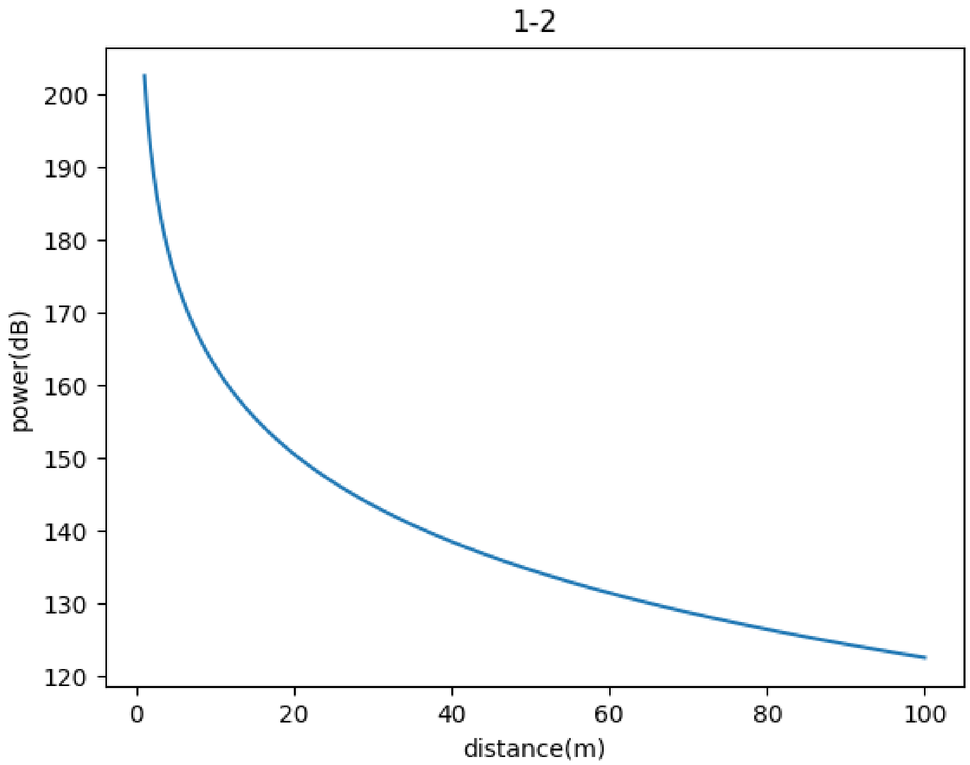
1-2

Compute thermal noise power: $N = kT_N B$ and convert it to dB.

Since there is no other device, we don't have to consider the interference power. SINR is SNR.

SINR(dB) can be obtained by signal power(dB) – noise power(dB). That is, the answer of 1-1 minus noise(dB).

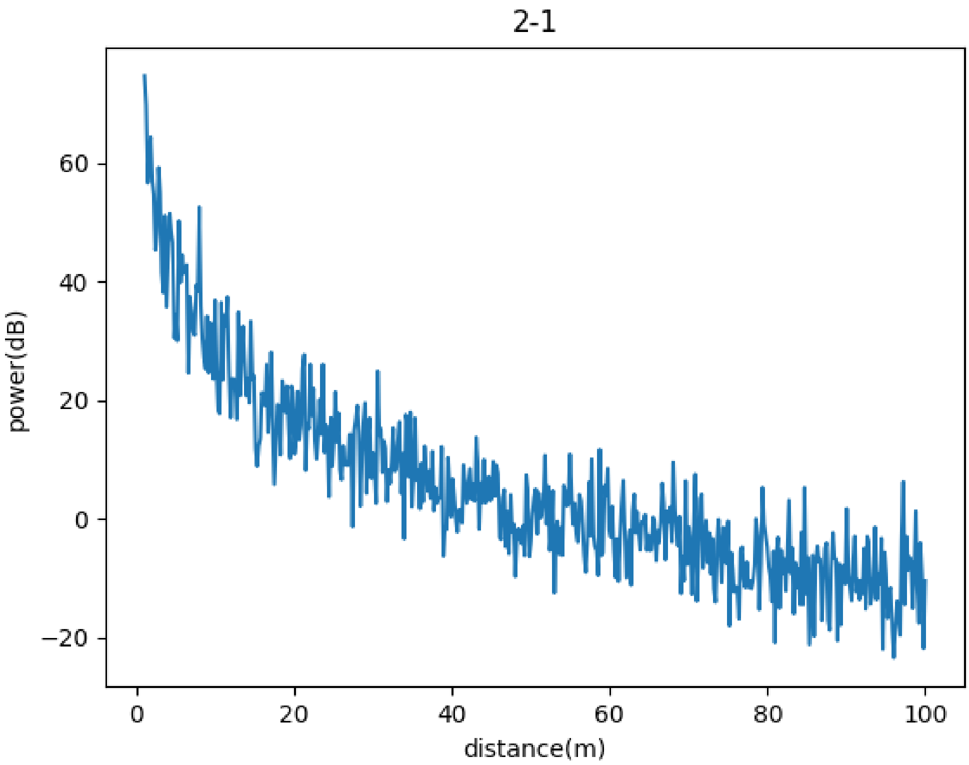
Figure1-2shows the simulation result.



2-1

Now we have to consider the shadowing effect. Applying log-normal distribution and multiply power(Watt) is equivalent to applying normal distribution and add power(dB). Therefore, the answer can be obtained by the answer + N(0, 6), where N is Gaussian distribution.

Figure2-1shows the simulation result.



2-2

Since there is no other device, we don't have to consider the interference power. SINR is SNR.

SINR(dB) can be obtained by signal power(dB) – noise power(dB). That is, the answer of 2-1 minus noise(dB).

Figure2-2shows the simulation result.